CLAIMS

1. (Previously Presented) A remote communication device comprising:

communication circuitry configured to at least one of receive communication signals and generate communication signals; and

an antenna coupled with the communication circuitry, the antenna including a first portion, a second portion and an impedance reduction portion, the first portion to substantially tune the antenna to a first frequency band, the first and second portions to tune the antenna simultaneously to a second frequency band different from the first frequency band, the impedance reduction portion coupled to the first and second portions to facilitate tuning to the first and second frequency bands.

2. (Original) The remote communication device according to claim 1 wherein the antenna comprises a microstrip antenna.

3. (Original) The remote communication device according to claim 1 wherein the antenna is configured to electromagnetically communicate with a return loss of less than or equal to approximately -9 dB within the first and second frequency bands.

4. (Previously Presented) The remote communication device according to claim 1 further comprising a power source coupled with the communication circuitry.

5. (Previously Presented) The remote communication device according to claim 1 wherein the antenna is configured to output the wireless signals, and the remote communication device further comprises another antenna coupled with the communication circuitry and substantially tuned to first and second different frequency bands, the another antenna being configured to receive the wireless signals.

6. (Previously Presented) The remote communication device according to claim 1 wherein the antenna is configured to communicate via backscatter modulation.

7. (Previously Presented) The remote communication device according to claim 5 further comprising a quarter-wavelength transmission line coupled intermediate the communication circuitry and the antenna.

8. (Original) The remote communication device according to claim 1 wherein the communication circuitry comprises radio frequency identification device circuitry

9. (Original) The remote communication device according to claim 1 wherein the frequency bands are centered at approximately 915 MHz and 2.45 GHz.

10. (Previously Presented) The remote communication device according to claim 1 wherein the first and second portions of the antenna are substantially symmetric.

11. (Previously Presented) A remote communication device comprising:

communication circuitry configured to at least one of receive communication signals and generate communication signals; and

an antenna coupled with the communication circuitry, the antenna having a plurality of substantially resonant frequencies and an impedance reduction strip integrated within a frequency tuning portion of the antenna; and

a quarter-wavelength transmission line coupled intermediate the communication circuitry and the antenna.

12. (Original) The remote communication device according to claim 11 wherein the antenna is substantially tuned to the resonant frequencies.

13. (Previously Presented) The remote communication device according to claim 11 wherein the antenna is configured to electromagnetically communicate with a return loss of less than or equal to approximately -9 dB at the resonant frequencies.

14. (Previously Presented) The remote communication device according to claim 11 wherein the antenna is configured to output the wireless signals, and further comprising another antenna coupled with the communication circuitry and configured to receive the wireless signals at a plurality of substantially resonant frequencies.

15. (Previously Presented) The remote communication device according to claim 14 wherein the antenna is configured to communicate via backscatter modulation.

16. (Previously Presented) The remote communication device according to claim 11 wherein the antenna comprises a dipole antenna with a return loss of less than -9 dB at the resonant frequencies.

17. (Original) The remote communication device according to claim 11 wherein the communication circuitry comprises radio frequency identification device circuitry.

18. (Previously Presented) A radio frequency identification device comprising:

communication circuitry configured to receive communication signals and generate communication signals according to an identification code stored to identify the radio frequency identification device ; and

at least one antenna coupled with the communication circuitry, the at least one antenna to simultaneously tune to a plurality of frequency bands including a first frequency band and a second frequency band, wherein a center frequency of the second frequency band is at least twice a center frequency of the first frequency band.

19. (Original) The radio frequency identification device according to claim 18 wherein the antenna is configured to receive the wireless signals, and further comprising another antenna coupled with the communication circuitry and substantially tuned to a plurality of frequencies, the another antenna being configured to output the wireless signals.

20. (Original) The radio frequency identification device according to claim 19 wherein the another antenna is configured to communicate via backscatter modulation.

21. (Original) The radio frequency identification device according to claim 18 wherein the antenna includes an impedance reduction conductor.

22-25. (Cancelled)

26. (Previously Presented) A radio frequency identification device comprising:

communication circuitry configured to receive forward signals from an interrogator and generate return signals according to an identification code stored to identify an object to which the radio frequency identification device is attached;

an antenna coupled with the communication circuitry and configured to communicate wireless signals at one of a plurality of frequencies including at least one of receiving the forward signals and outputting the return signals; and

wherein the antenna is simultaneously substantially tuned to the frequencies, but not tuned to at least one frequency between two of the plurality of frequencies, at a moment in time.

27. (Previously Presented) The radio frequency identification device according to claim 26 wherein the antenna is configured to communicate at one frequency responsive to a frequency of communication of the interrogator.

28. (Original) The radio frequency identification device according to claim 26 wherein the antenna is configured to receive the forward signals, and further comprising another antenna coupled with the communication circuitry and configured to output the return signals at one of a plurality of frequencies.

29. (Original) The radio frequency identification device according to claim 28 wherein the another antenna is configured to communicate via backscatter modulation.

30. (Previously Presented) The radio frequency identification device according to claim 26 wherein the impedance reduction conductor tunes the antenna to one of the frequencies.

31-37. (Cancelled)

38. (Previously Presented) A wireless communication method comprising:

providing a remote communication device having an antenna simultaneously substantially tuned to first and second different frequency bands; and

communicating wireless signals using the antenna, including at least one of:

receiving wireless signals at a frequency within one of the frequency bands, and

outputting wireless signals at a frequency within one of the frequency bands;

wherein the antenna is not tuned to at least one frequency between the first and the second different frequency bands, and the antenna includes an impedance reduction strip integrated within the antenna to facilitate tuning to the first and second frequency bands.

39. (Original) The method according to claim 38 wherein the providing comprises providing a remote communication device having the antenna configured to electromagnetically

communicate with a return loss of less than or equal to approximately -9 dB within the first and second frequency bands.

40. (Original) The method according to claim 38 wherein the providing comprises providing a remote communication device having a plurality of antennas individually substantially tuned to first and second different frequency bands.

41. (Original) The method according to claim 40 wherein the communicating comprises receiving using one of the antennas and outputting using another of the antennas.

42. (Original) The method according to claim 38 further comprising processing wireless signals using the remote communication device.

43. (Original) The method according to claim 38 wherein the providing comprises providing a radio frequency identification device.

44-49. (Cancelled)

50. (Previously Presented) A radio frequency identification device communication method comprising:

affixing a radio frequency identification device to an object to wirelessly identify the object via wireless signals at a plurality of frequencies using at least one antenna of the radio frequency identification device, the at least one antenna being simultaneously substantially tuned to the frequencies but not tuned to at least one frequency between two of the plurality of frequencies;

receiving forward signals at one of the frequencies; and

outputting return signals at one of the frequencies.

51. (Previously Presented) The method according to claim 50 wherein the providing comprises providing the radio frequency identification device having the one antenna configured to output the return signals.

52. (Original) The method according to claim 50 further comprising processing wireless signals using the radio frequency identification device.

53. (Original) The method according to claim 50 wherein the receiving and outputting occur at the same frequency.

54-56. (Cancelled)

57. (Previously Presented) A method of forming a radio frequency identification device comprising:

providing communication circuitry configured to at least one of receive forward signals and output return signals;

forming at least one antenna to allow simultaneously communicate at a plurality of resonant frequencies, the at least one antenna not tuned to at least one frequency between two of the plurality of resonant frequencies; and

coupling the at least one antenna with the communication circuitry.

58. (Previously Presented) The method according to claim 57 further comprising coupling a power source with the communication circuitry.

59. (Original) The method according to claim 57 wherein the providing comprises providing radio frequency identification device communication circuitry.

60. (Original) The method according to claim 57 wherein the coupling comprises coupling a plurality of antennas with the communication circuitry, one of the antennas being configured to receive wireless signals corresponding to the forward signals and the other of the antennas being configured to communicate wireless signals corresponding to the return signals.

61. (Previously Presented) The method according to claim 57 wherein the coupling comprises coupling the at least one antenna comprising a dipole antenna.

62-72. (Cancelled)

73. (Previously Presented) The remote communication device according to claim 1 wherein the antenna is substantially tuned to the first and second different frequency bands having different respective carrier frequencies.

74. (Previously Presented) The remote communication device according to claim 1 wherein the antenna is configured to communicate at different substantially resonant frequencies corresponding to signals generated using at least one interrogator and which have different carrier frequencies.

75. (Previously Presented) The radio frequency identification device according to claim 18 wherein the plurality of frequencies correspond to different carrier frequencies of the communication signals.

76. (Cancelled)

77. (Previously Presented) The radio frequency identification device according to claim 26 wherein the frequencies comprise carrier frequencies of the forward and return signals.

78-80. (Cancelled)

81. (Previously Presented) The remote communication device according to claim 1 wherein the communication circuitry is configured to control reflection, by the antenna, of electromagnetic energy present at the remote communication device to implement backscatter communications.

82. (Previously Presented) The remote communication device according to claim 4 wherein the power source comprises a battery.

83-87. (Cancelled)

88. (Previously Presented) The radio frequency identification device according to claim 18 wherein the at least one antenna comprises a first loop antenna and a second antenna.

89. (Previously Presented) The radio frequency identification device according to claim 88 wherein a first loop antenna is configured to receive radio frequency wireless signals and the second antenna is configured to transmit radio frequency wireless signals.

90. (Previously Presented) The method according to claim 57 wherein the at least one antenna comprises a first antenna and a second antenna.

91. (Previously Presented) The method according to claim 90 wherein the first antenna is a loop antenna.

92. (Previously Presented) A radio frequency identification (RFID) device, comprising:

a first loop antenna configured to operate at a first frequency;

a second antenna configured to operate at a second frequency which is at least twice the first frequency; and

a communication circuitry coupled to the first antenna and the second antenna, the communication circuitry comprising a transmitter and a receiver, the receiver configured to receive wireless radio frequency interrogation signals via one of the first antenna and the second antenna, the transmitter configured to use one of the first antenna and the second antenna to modulate a radio continuous wave signal to provide, in response to the wireless signals, information that identifies the RFID device, wherein the continuous wave signal is provided by a separate device interrogating the RFID device.

93. (Previously Presented) The RFID device of claim 92, wherein the first antenna is configured to operate at a plurality of frequencies including the first frequency and the second frequency; and the second antenna is configured to operate at the plurality of frequencies including the first frequency and the second frequency.

94. (Previously Presented) The RFID device of claim 92, wherein the receiver is configured to use the first antenna to receive the wireless radio frequency interrogation signals; and the transmitter is configured to use the second antenna to modulate the continuous wave signal.

95. (Previously Presented) The RFID device of claim 92, wherein the RFID device is configured to communicate the information that identifies the radio frequency identification device without utilizing magnetic field effect.

96. (Previously Presented) The RFID device of claim 92, wherein the transmitter is configured to communicate with the separate device in one of a first communication mode and a second communication mode determined by the separate device, wherein in accordance with the first communication mode the RFID device modulates a radio frequency (RF) field generated by the RFID device and in accordance with the second communication mode the RFID device modulates an RF field generated by the separate device.

97. (Previously Presented) The RFID device of claim 92, wherein the transmitter is configured to transmit at a bit rate specified by the separate device.

98. (Previously Presented) The RFID device of claim 92, wherein the communication circuitry is configured to transition from a sleep state in response to a wake up command from the separate device.

99. (Previously Presented) The RFID device of claim 92, wherein the communication circuitry is configured to generate a random number to identify the RFID device.

100. (Previously Presented) The device of claim 92, wherein the communication circuitry comprises an integrated circuit; and the first and second antennas are coupled to the integrated circuit.

101. (Previously Presented) The device of claim 92, wherein the communication circuitry is configured to use the first loop antenna for a first communication range and to use the second antenna for a second communication range larger than the first communication range.

102. (Previously Presented) The device of claim 92, wherein the first antenna is configured to operate in a first frequency band, the second antenna in a second frequency band; wherein the first frequency band and the second frequency band are exclusive non-overlapping.

103. (Previously Presented) A radio frequency identification (RFID) device, comprising:

a first antenna and a second antenna configured to operate in a plurality of exclusive non-overlapping frequency bands; and

a communication circuitry coupled to the first antenna and the second antenna to receive and process radio frequency (RF) communication signals, the communication circuitry configured to receive the communication signals via one of the first antenna and the second antenna and, in response, to transmit identification signals via one of the first antenna and the second antenna, the identification signals to identify the RFID device via modulating an RF field generated by an interrogating device.

104. (Previously Presented) The RFID device of claim 103, wherein a central frequency of a first frequency band of the frequency bands is at least twice a central frequency of a second frequency band of the frequency bands.

105. (Previously Presented) The RFID device of claim 103, wherein the first antenna is configured to transmit signals in the first band; and the second antenna comprises a loop antenna configured to receive signals in the second band.

106. (Previously Presented) The RFID device of claim 105, wherein the communication circuitry is configured to use the first antenna to modulate a continuous wave signal in the RF field to transmit the identification signals.

107. (Previously Presented) The RFID device of claim 105, wherein the identification signals are transmitted without utilizing magnetic field effect.

108. (Previously Presented) The RFID device of claim 103, wherein the communication circuitry is configured to communicate with the interrogating device in one of an active mode and a passive mode, wherein in the active mode the RFID device modulates an RF field generated by the RFID device and in the passive mode the RFID device modulates an RF field generated by the interrogating device.

109. (Previously Presented) The RFID device of claim 103, wherein the communication circuitry is configured to transmit the identification signals at a bit rate specified by the interrogating device.

110. (Previously Presented) A radio frequency identification (RFID) method, comprising:

providing an RFID device having a first loop antenna and a second antenna configured to operate in a plurality of exclusive non-overlapping frequency bands;

receiving, from an interrogating device, an interrogation signal via one of the first antenna and the second antenna; and

transmitting, in response to the interrogation signal, an identification signal to identify the RFID device to the interrogating device via one of the first antenna and the second antenna, wherein the identification signal is generated by modulating an RF field provided by the interrogating device.

111. (Previously Presented) The method of claim 110, wherein the interrogation signal and the identification signal have a same carrier frequency.

112. (Previously Presented) The method of claim 110, further comprising:

switching between an active mode and a passive mode, wherein in the active mode the RFID device modulates an RF field generated by the RFID device and in the passive mode the RFID device modulates the RF field provided by the interrogating device.

113. (Previously Presented) The method of claim 112, wherein the RFID device is configured to communicate the identification signal at a bit rate specified by the interrogating device.

114. (Previously Presented) The method of claim 113, further comprising:
transition the RFID device from a sleep state in response to a wake up command from the interrogating device.

115. (Previously Presented) The method of claim 110, further comprising:
generating a random number to identify the RFID device, wherein the identification signal includes the random number.

116. (Previously Presented) A method to forming a radio frequency identification (RFID) device, the method comprising:
providing communication circuitry configured to receive interrogation signals and output identification signals; and
forming a first loop antenna and a second antenna;
coupling the first loop antenna and the second antenna to the communication circuitry to allow the communication circuitry to use the first loop antenna and the second antenna to communicate wireless signals, including the interrogation signals and the identification signals, in a plurality of exclusive non-overlapping frequency bands.

117. (Previously Presented) The method of claim 116, wherein the communication circuitry is configured to switch between an active mode of signal transmission and a passive mode of signal transmission.

118. (Previously Presented) The method of claim 116, wherein the communication circuitry is configured to communicate the identification signals at a bit rate specified by an interrogating device.

119. (Previously Presented) The method of claim 118, wherein the communication circuitry is configured to transition from a sleep state in response to a wake up command from the interrogating device.

120. (Previously Presented) The method of claim 116, wherein the communication circuitry is configured to generate a random number to identify the RFID device.

121. (Previously Presented) A radio frequency identification (RFID) system, comprising:
a first RFID device to transmit wireless interrogation signals;
a second RFID device having a communication circuitry, a first loop antenna and a second antenna configured to operate at a plurality of frequencies, a first frequency of the frequencies being at least twice a second frequency of the frequencies, wherein in response to the interrogation signals, the second RFID device is to use one of the first loop antenna and the second antenna to provide identification signals, via modulating a radio frequency (RF) field provided by the first RFID device, the identification signals identifying the second RFID device to the first RFID device.

122. (Previously Presented) The system of claim 121, wherein the second RFID device comprises a transmitter configured communicate with the first RFID device in one of a first communication mode and a second communication mode determined by the first RFID device, wherein in accordance with the first communication mode the transmitter modulates an RF field generated by the second RFID device and in accordance with the second communication mode the transmitter modulates an RF field generated by the first RFID device.

123. (Previously Presented) The system of claim 122, wherein the transmitter is configured to transmit at a bit rate specified by the first RFID device.

124. (Previously Presented) The system of claim 121, wherein the communication circuitry is configured to transition from a sleep state in response to a wake up command from the first RFID device.

125. (Previously Presented) The system of claim 121, wherein the communication circuitry of the second RFID device is configured to use the first loop antenna to receive the interrogation signals and use the second antenna to transmit the identification signals.

126. (Previously Presented) The system of claim 121, wherein the interrogation signals and the identification signals have a same carrier frequency.

127. (Previously Presented) The system of claim 121, wherein the identification signals include a random number generated by the second RFID device to identify the second RFID device.